

What is claimed is:

1. A method for canceling the effect of a transformer blocking capacitor in an interface circuit on the impedance between tip/ring lines, said method comprising the steps of:

5           sensing a differential voltage across the transformer blocking capacitor;  
generating a cancellation signal based on said differential voltage; and  
adding said cancellation signal to the tip/ring lines.

10           2. The method of claim 1, wherein said cancellation signal is single ended.

15           3. The method of claim 2, wherein said generating step comprises amplifying said single ended cancellation signal.

20           4. The method of claim 3, wherein said amplifying step comprises amplifying said single ended cancellation signal by a predetermined amount based on said transformer blocking capacitor's capacitance.

25           5. The method of claim 2, wherein said adding step comprised differentially adding said single ended cancellation signal to the tip/ring lines.

30           6. The method of claim 1, wherein said adding step comprises adding said cancellation signal directly across the transformer blocking capacitor.

7. The method of claim 1, wherein said adding step comprises differentially adding said cancellation signal to the tip/ring lines.

8. The method of claim 1, wherein said adding step comprises differentially adding a  
5 voltage signal reflecting said cancellation signal to the tip/ring lines.

9. The method of claim 1, wherein said step of adding said cancellation signal increases the impedance between the tip/ring lines.

10. A method for controlling the impedance between tip/ring lines in an interface circuit having a transformer blocking capacitor, said method comprising the steps of:  
determining a differential tip/ring current;  
synthesizing an impedance based on said differential tip/ring current;  
adding said synthesized impedance to the tip/ring lines;  
15 sensing a differential voltage across the transformer blocking capacitor;  
generating a cancellation signal from said sensed differential voltage; and  
adding said cancellation signal to the tip/ring lines.

11. The method of claim 10, wherein said cancellation signal is single ended.

20 12. The method of claim 11, wherein said generating step comprises amplifying said single ended cancellation signal.

13. The method of claim 10, wherein said generating step comprises the steps of:  
amplifying a capacitor voltage signal based on said differential voltage.

14. The method of claim 10, wherein said step of adding said cancellation signal to  
5 the tip/ring lines comprises the step of:  
combining said cancellation signal with said synthesized impedance.

15. The method of claim 10, wherein said adding step comprises differentially adding  
a voltage reflecting said cancellation signal to the tip/ring lines.

16. An apparatus for canceling the effect of a transformer blocking capacitor in an  
interface circuit on the impedance between tip/ring lines, the interface circuit including a  
CODEC and SLIC for synthesizing an impedance between the tip/ring lines based on a  
differential current on the tip/ring lines, said apparatus comprising;

15 a sensor to sense a differential voltage across the transformer blocking capacitor and  
develop a capacitor signal from said sensed differential voltage; and  
an amplifier to amplify said capacitor signal to obtain a cancellation signal, said  
cancellation signal cancelling the impedance effect of the transformer blocking capacitor  
when added to the tip/ring lines.

20 17. The apparatus of claim 16, wherein said cancellation signal results in a differential  
voltage being produced at the SLIC for placement on the tip/ring lines.

18. An apparatus for controlling the impedance between tip/ring lines in an interface circuit, said apparatus comprising:

a transformer having a transformer blocking capacitor, said transformer coupled between the tip/ring lines for passing frequencies above a first predetermined level;

5 a low pass filter coupled between the tip/ring lines for passing frequencies below a second predetermined level;

a CODEC for generating an impedance voltage based on a portion of current on the tip/ring lines;

10 a circuit coupled to said transformer blocking capacitor to sense a differential voltage across said transformer blocking capacitor and develop a cancellation signal based on said sensed differential voltage to place on the tip/ring lines; and

15 a SLIC coupled between said CODEC and said low pass filter, said SLIC configured to interface said CODEC with the tip/ring lines through said low pass filter, said SLIC synthesizing an impedance between the tip/ring lines based on the impedance voltage generated by the CODEC.

19. The apparatus of claim 18, said circuit configured to add said cancellation signal to the tip/ring lines through said SLIC and said low pass filter.

20. The apparatus of claim 19, said SLIC configured to add a differential voltage reflecting said cancellation signal to the tip/ring lines.

21. The apparatus of claim 18, said circuit configured to add said cancellation signal directly across said transformer blocking capacitor.

22. The apparatus of claim 18, wherein said circuit comprises at least;  
5           a sensor to sense said differential voltage across said transformer blocking capacitor and develop a capacitor signal from said sensed differential voltage; and  
              an amplifier to amplify said capacitor signal, said cancellation signal based on said amplified capacitor signal.

10           23. The apparatus of claim 18, said apparatus for use at a service provider.

24. The apparatus of claim 23, said low pass filter passing signals in a POTS frequency band and said transformer passing signals in an ADSL frequency band.

15           25. The apparatus of claim 18, wherein the impedance voltage is single ended.

26. An apparatus for generating a cancellation signal to cancel the effect of a transformer blocking capacitor on impedance between tip/ring lines, said apparatus comprising:  
transformer blocking capacitor, a second input configured for coupling to a second side of the transformer

20           a circuit having a first input configured for coupling to a first side of the transformer blocking capacitor, a second input configured for coupling to a second side of the transformer blocking capacitor, and an output; and

a SLIC having an input coupled to the output of said circuit and an output configured for coupling to the tip/ring lines.

27. The apparatus of claim 26, said SLIC configured to differentially add a voltage to  
5 the tip/ring lines.

28. An apparatus for generating a cancellation signal to cancel the effect of a  
transformer blocking capacitor on impedance between tip/ring lines, said apparatus  
comprising:

an inverter having an input and an output configured for coupling to a first end of the  
transformer blocking capacitor; and

10 a first amplifier having a first input configured for coupling to the first end of the  
transformer blocking capacitor, a second input configured for coupling to a second end of the  
transformer blocking capacitor, and an output coupled to the input of said inverter and  
15 configured for coupling to the second end of the transformer blocking capacitor.

29. The apparatus of claim 28, said inverter comprising a second amplifier configured  
as an inverter.